Space Weather Forecast

Issued on Sunday, 22 October 2023 at 13:10 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Weak Coronal Mass Ejection arrivals possible on Day 1 (22 Oct), with fast wind arrivals later in the period, giving a slight chance of G1/Minor Storm intervals.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low over the past 24 hours, with just one low level Common-class flare. There are currently five sunspot regions on the visible disc, all of which are relatively small and simple. The two slightly larger regions on the disc have both started to fade a little.
No Earth directed Coronal Mass Ejections (CMEs) have been seen in imagery during the last 24 hours.

Solar Wind / Geomagnetic Activity: The solar wind may be showing signs of some very weak CME enhancement. The wind speed has been at slow levels, between 280-330 km/s. The Interplanetary Magnetic Field has been mostly weak, but with occasional moderate peaks. The north-south component has been mostly weakly southward directed. Geomagnetic activity has been Quiet to Unsettled (Kp 1-3).

Energetic Particles / Solar Radiation: No solar radiation storms were observed, with energetic particles at background levels throughout.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to remain Low or Very Low, with an ongoing chance of isolated Common-Class flares. There is a very slight chance of Moderate-class flares.

Solar Wind / Geomagnetic Activity: There have been two Earth-directed CMEs in the forecast, which are now late and considered likely to have mostly missed Earth. A very minor recent enhancement in the solar wind may be the edge of this feature, which could have combined into one CME. A third very slow CME is expected to pass to the south of Earth later on Day 4 (25 Oct) and may glance, but is more likely to miss. There is also the potential for coronal hole fast wind enhancements, on Day 2 or Day 3 (23-24 Oct), then again perhaps later on Day 4 (25 Oct). Geomagnetic activity is expected to be predominantly Quiet to Unsettled (Kp 0-3). There is a chance of Active (Kp 4) intervals and a slight chance of a G1/Minor Storm (Kp 5) in association with CME and fast wind effects, most likely on Day 1 with any CME arrival and Day 4 should the fast wind arrive.

Energetic Particles / Solar Radiation: No solar radiation storms are expected.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	5	5	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	5	10	10	10
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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